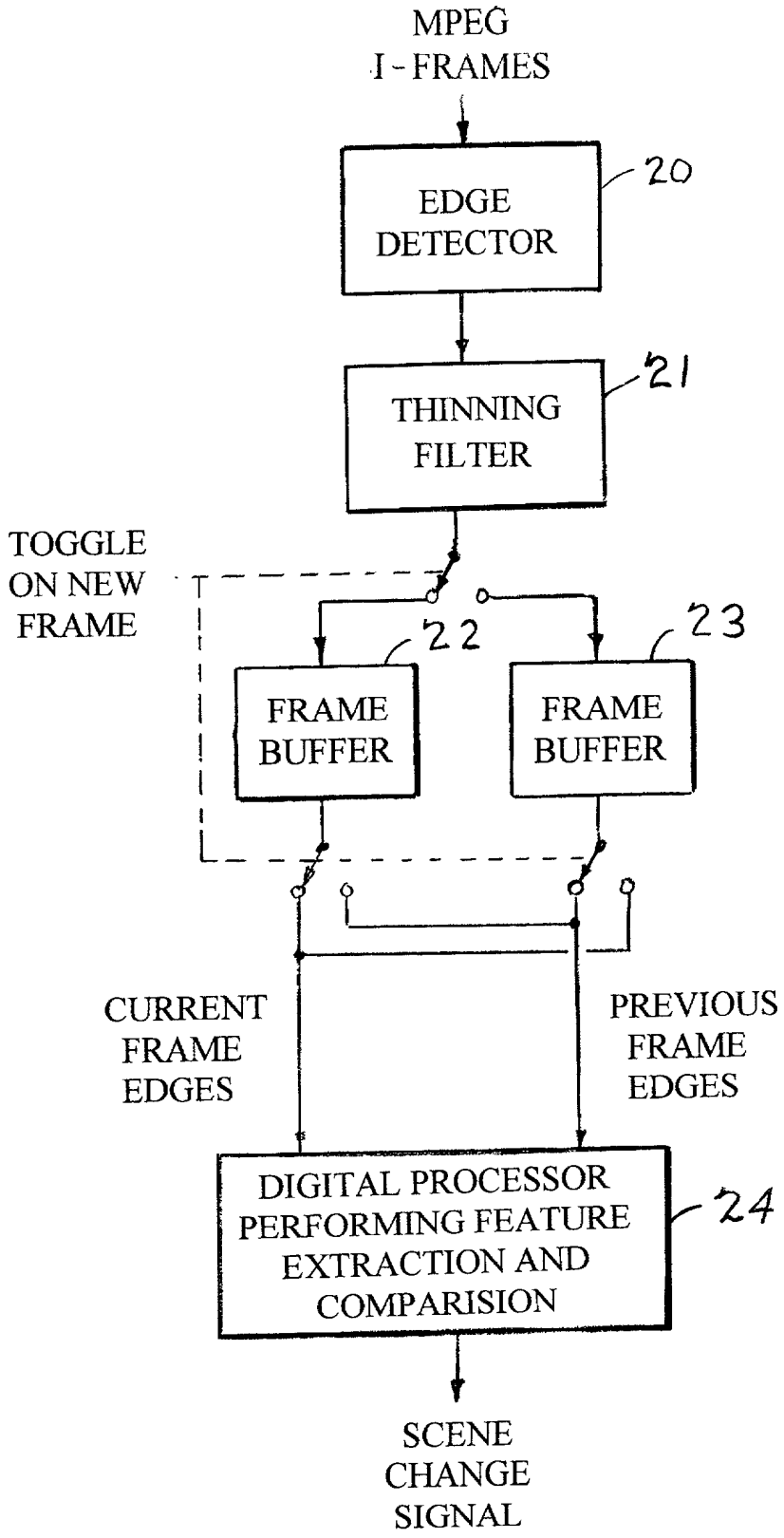
MPEG
I-FRAMES
EDGE
DETECTOR
20
THINNING
FILTER
21
TOGGLE
ON NEW
FRAME
22
23
FRAME
BUFFER
FRAME
BUFFER
CURRENT
FRAME
EDGES
PREVIOUS
FRAME
EDGES
DIGITAL PROCESSOR
PERFORMING FEATURE
EXTRACTION AND
COMPARISION
24
SCENE
CHANGE
SIGNAL

FIG. 1

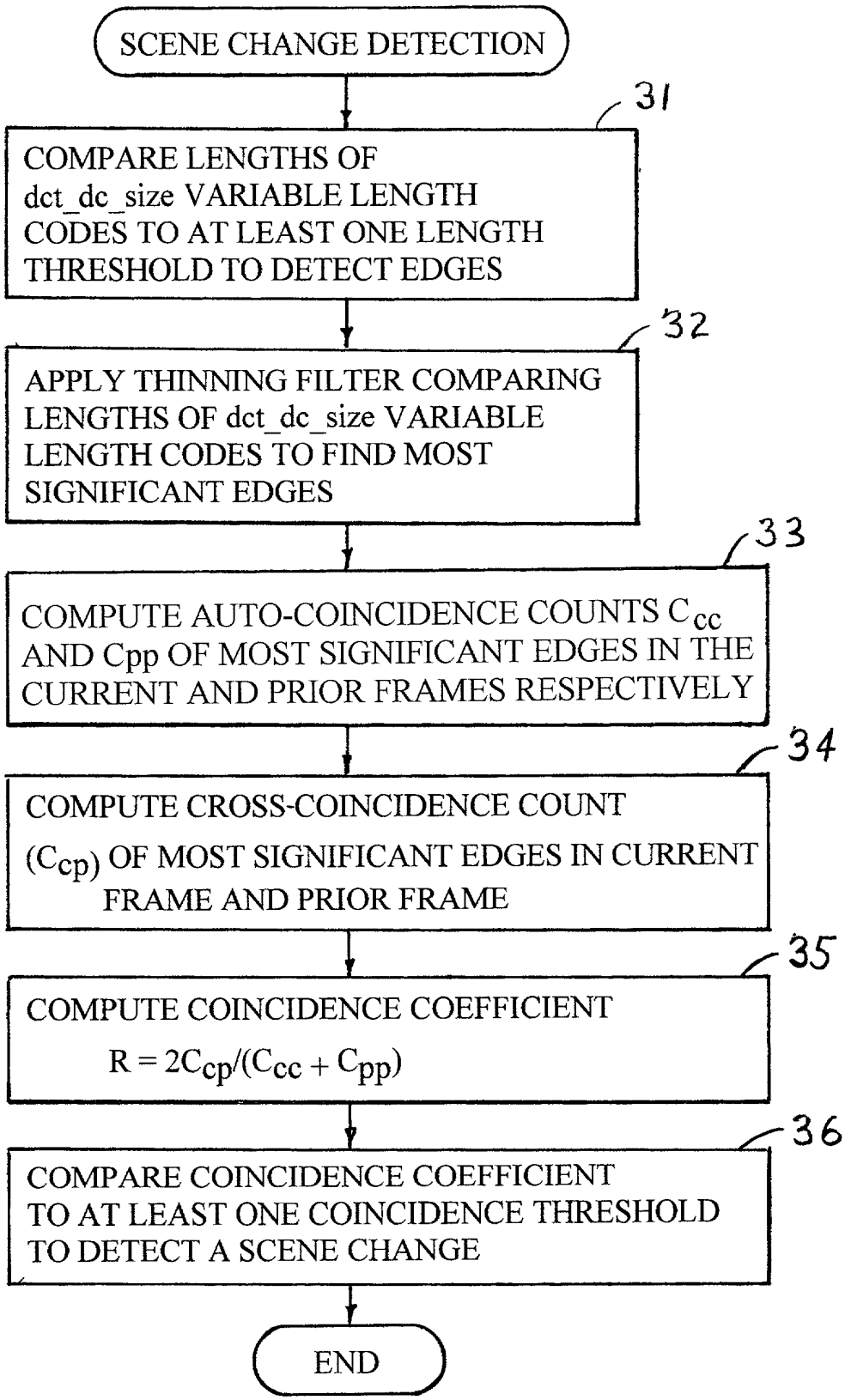
SCENE CHANGE DETECTION
31
COMPARE LENGTHS OF dct_dc_size VARIABLE LENGTH CODES TO AT LEAST ONE LENGTH THRESHOLD TO DETECT EDGES
32
APPLY THINNING FILTER COMPARING LENGTHS OF dct_dc_size VARIABLE LENGTH CODES TO FIND MOST SIGNIFICANT EDGES
33
COMPUTE AUTO-COINCIDENCE COUNTS C_{cc} AND Cpp OF MOST SIGNIFICANT EDGES IN THE CURRENT AND PRIOR FRAMES RESPECTIVELY
34
COMPUTE CROSS-COINCIDENCE COUNT (C_{cp}) OF MOST SIGNIFICANT EDGES IN CURRENT FRAME AND PRIOR FRAME
35
COMPUTE COINCIDENCE COEFFICIENT $R = 2C_{cp}/(C_{cc} + C_{pp})$
36
COMPARE COINCIDENCE COEFFICIENT TO AT LEAST ONE COINCIDENCE THRESHOLD TO DETECT A SCENE CHANGE
END

FIG. 2

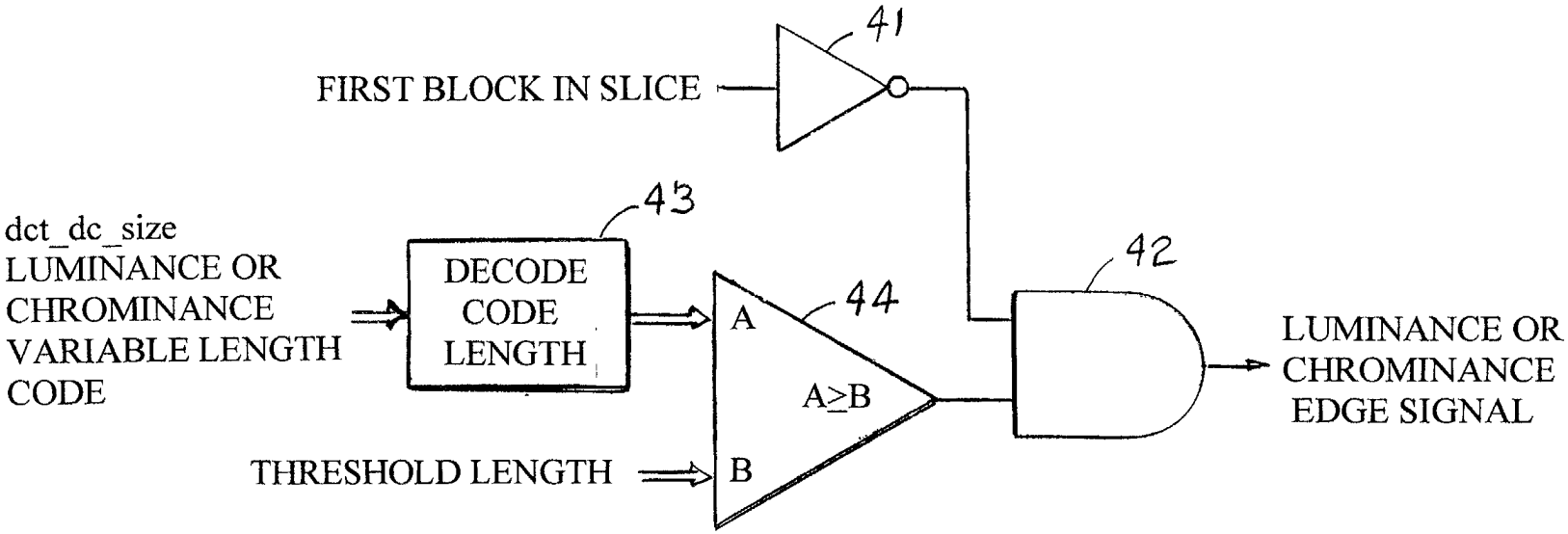
41
FIRST BLOCK IN SLICE
43
dct_dc_size
LUMINANCE OR
CHROMINANCE
VARIABLE LENGTH
CODE
DECODE
CODE
LENGTH
44
A
A≥B
B
THRESHOLD LENGTH
42
LUMINANCE OR
CHROMINANCE
EDGE SIGNAL

FIG. 3

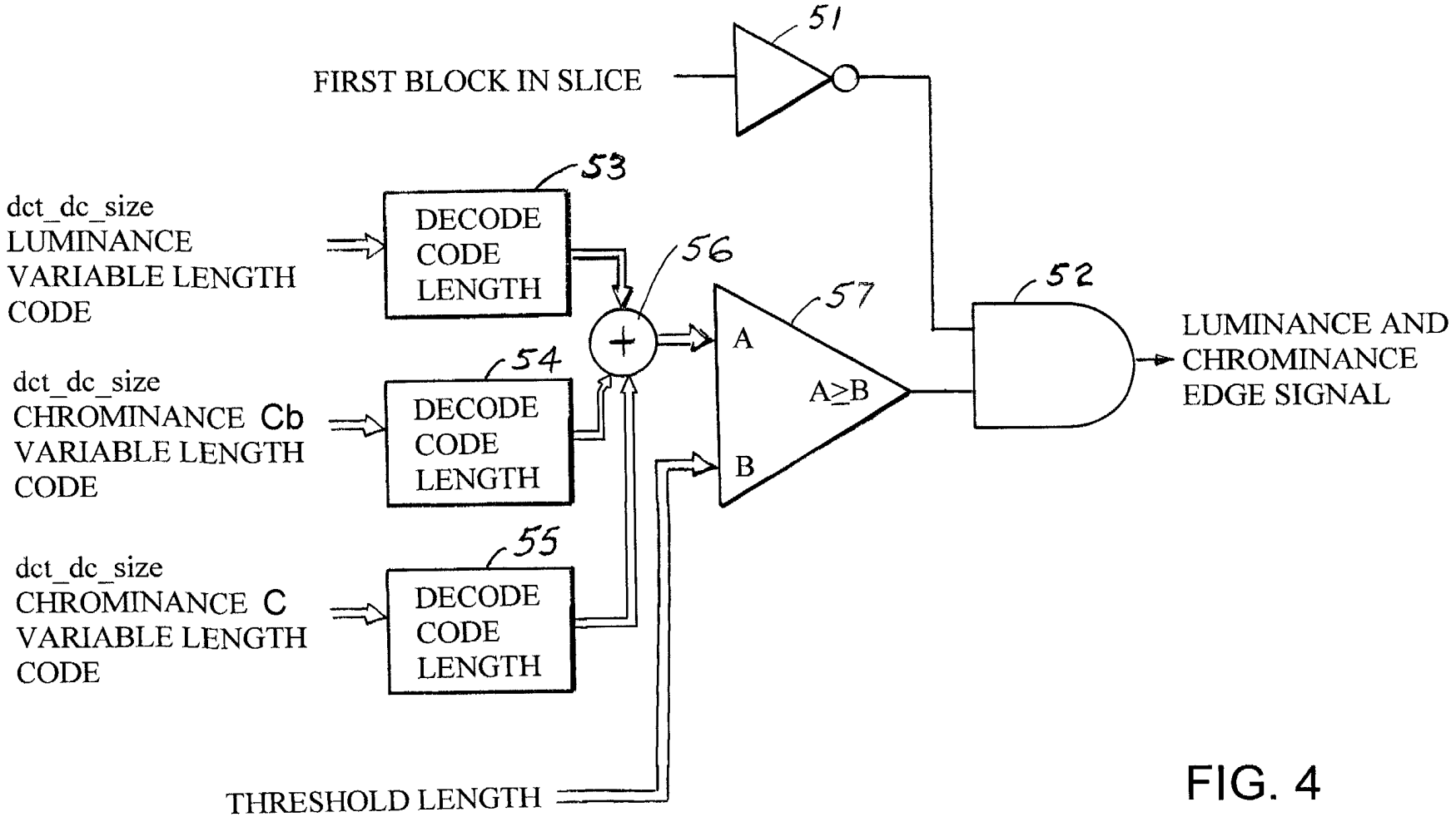

FIG. 4

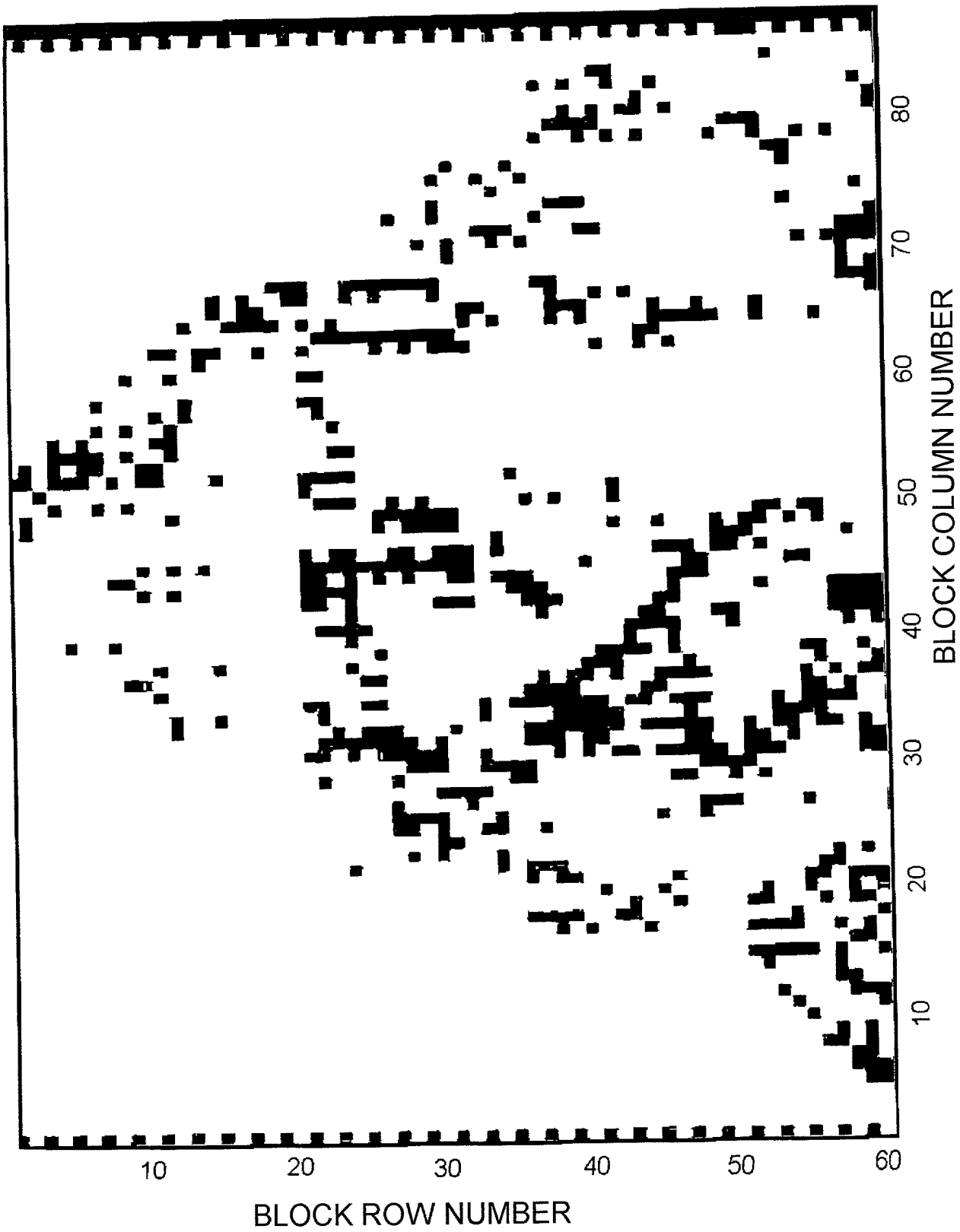
10
20
30
40
50
60
BLOCK ROW NUMBER
10
20
30
40
50
60
70
80
BLOCK COLUMN NUMBER

FIG. 5

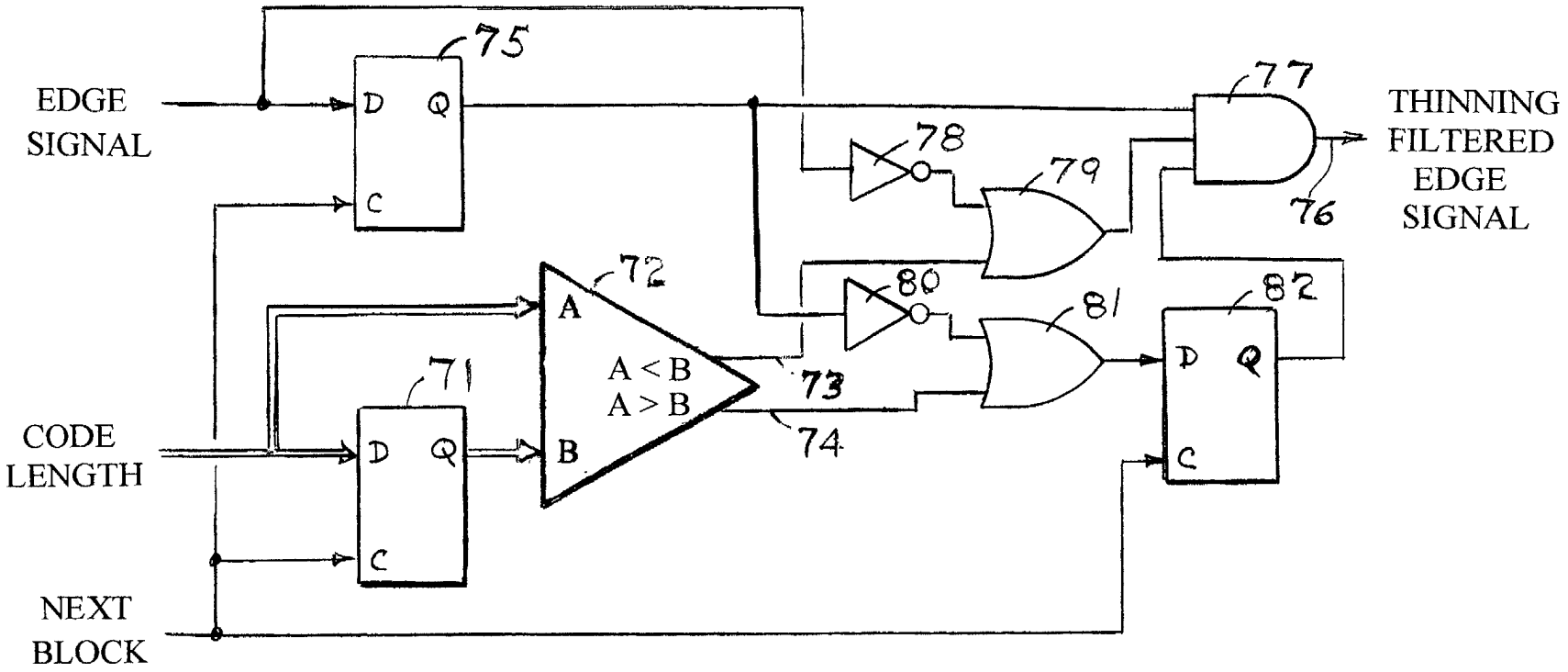

FIG. 6

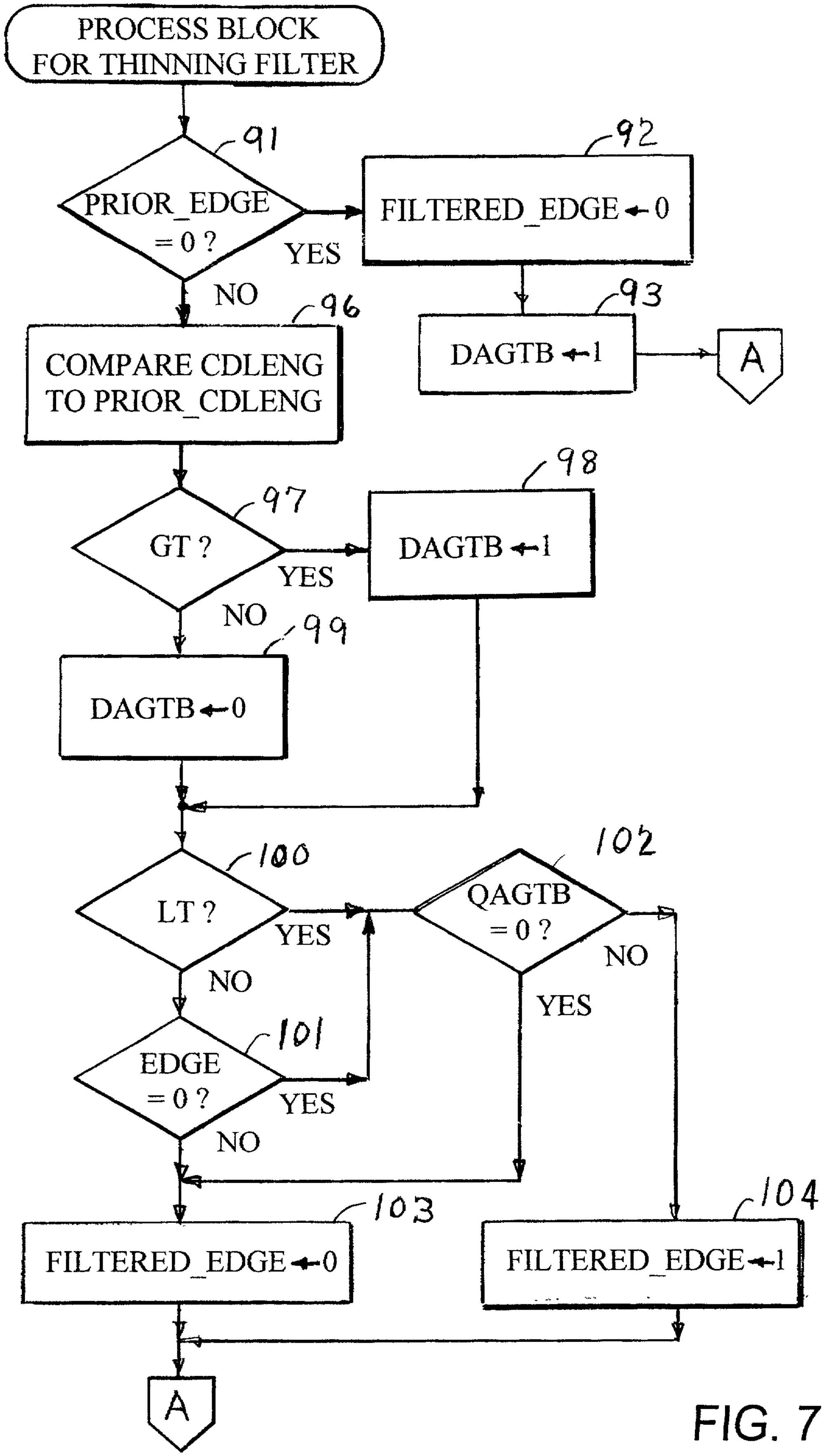
PROCESS BLOCK FOR THINNING FILTER
91
PRIOR_EDGE = 0 ?
YES
NO
92
FILTERED_EDGE ← 0
93
DAGTB ← 1
A
96
COMPARE CDLENG TO PRIOR_CDLENG
97
GT ?
YES
NO
98
DAGTB ← 1
99
DAGTB ← 0
100
LT ?
YES
NO
101
EDGE = 0 ?
YES
NO
102
QAGTB = 0 ?
NO
YES
103
FILTERED_EDGE ← 0
104
FILTERED_EDGE ← 1
A

FIG. 7

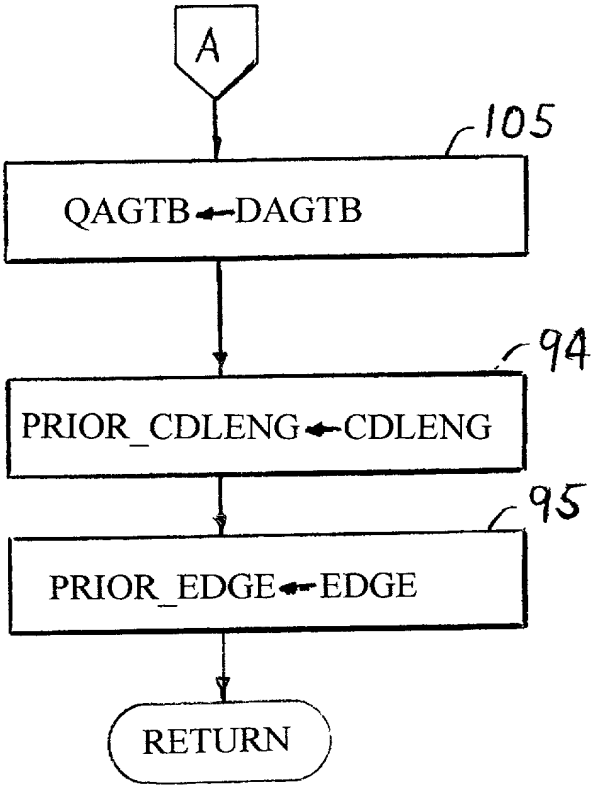
A
105
QAGTB←DAGTB
94
PRIOR_CDLENG←CDLENG
95
PRIOR_EDGE←EDGE
RETURN

FIG. 8

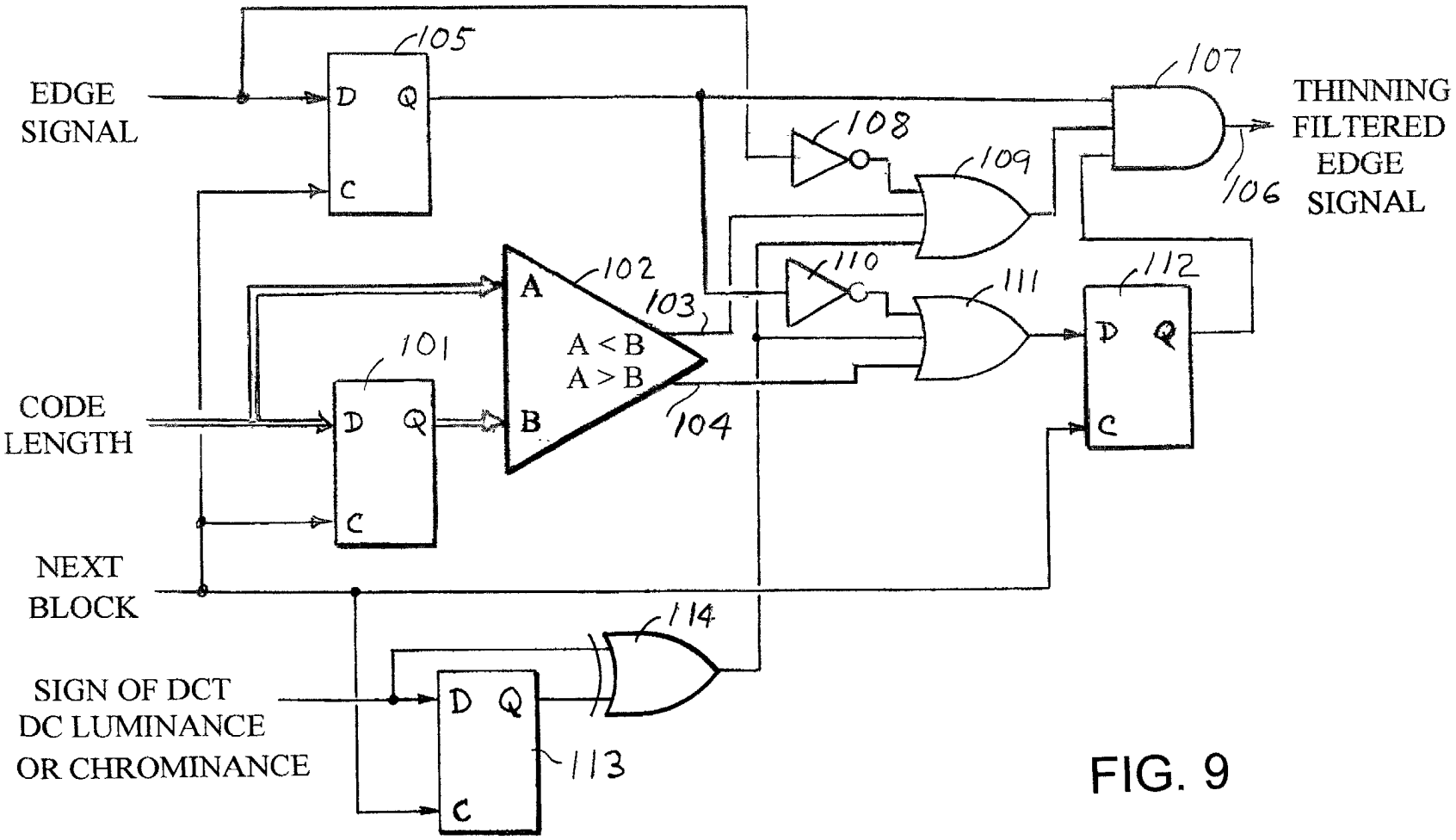
EDGE SIGNAL
105
D
Q
C
107
THINNING FILTERED EDGE SIGNAL
108
109
106
110
111
112
102
103
A
A < B
A > B
B
101
104
CODE LENGTH
NEXT BLOCK
114
SIGN OF DCT DC LUMINANCE OR CHROMINANCE
113

FIG. 9

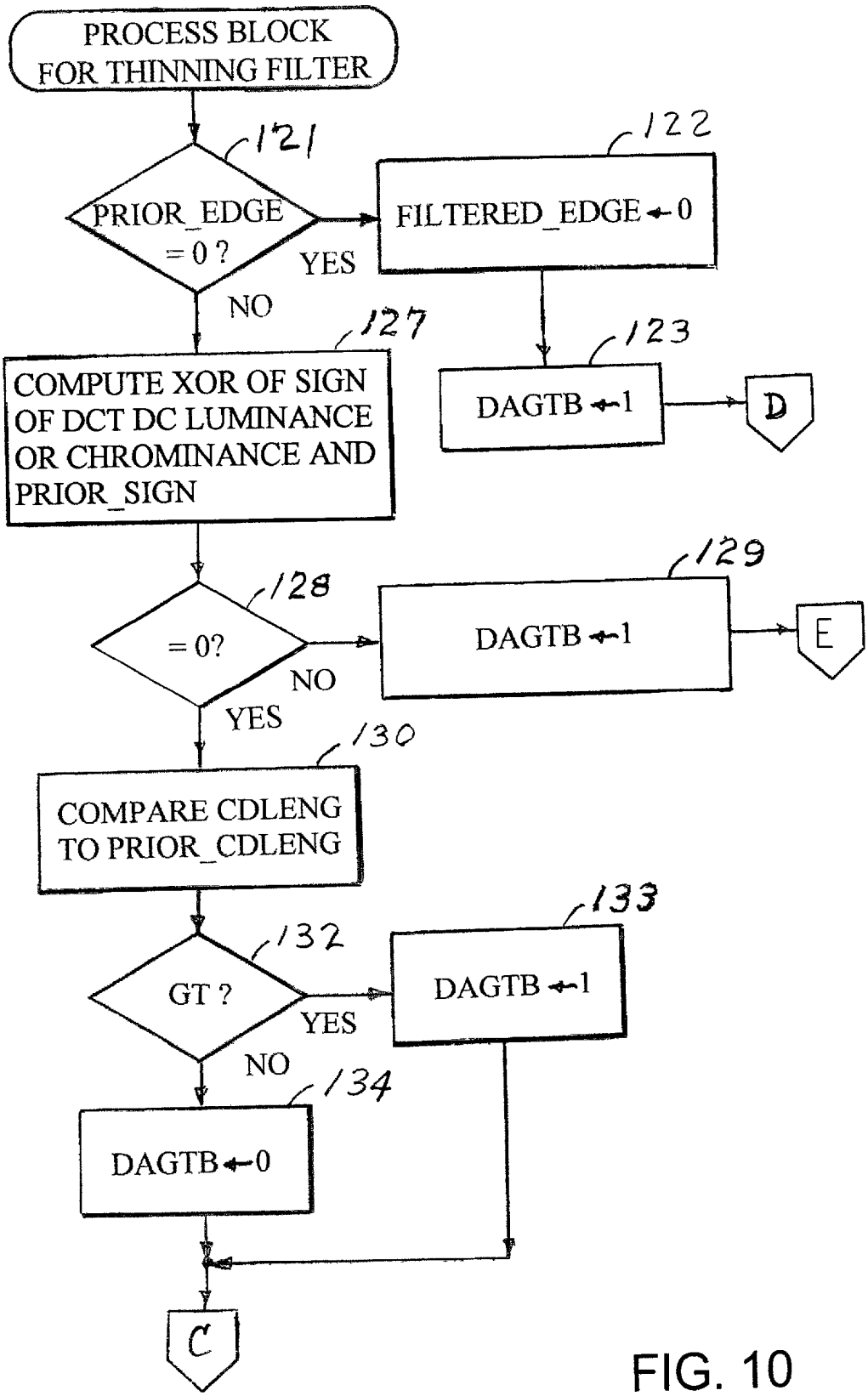

FIG. 10

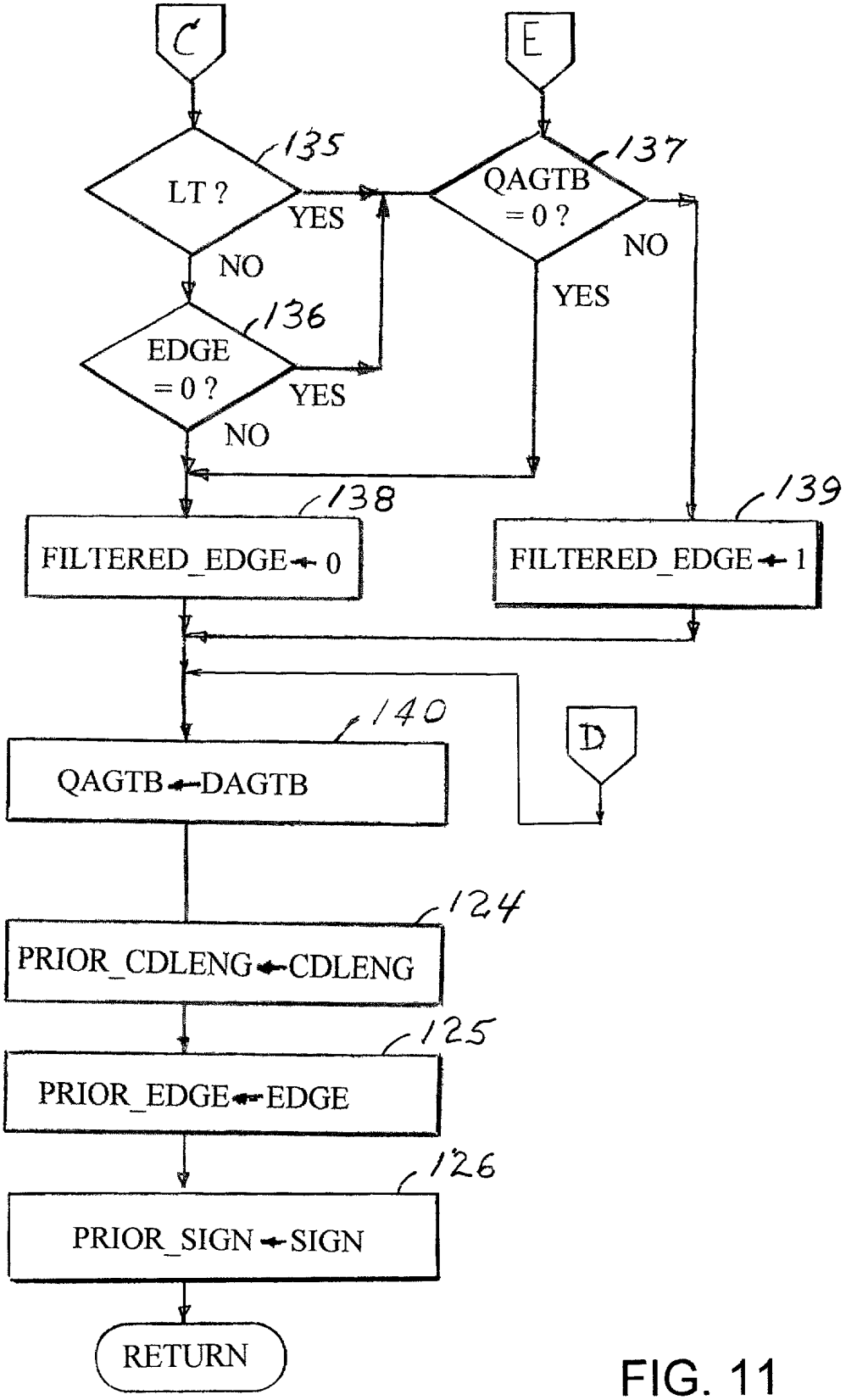

FIG. 11

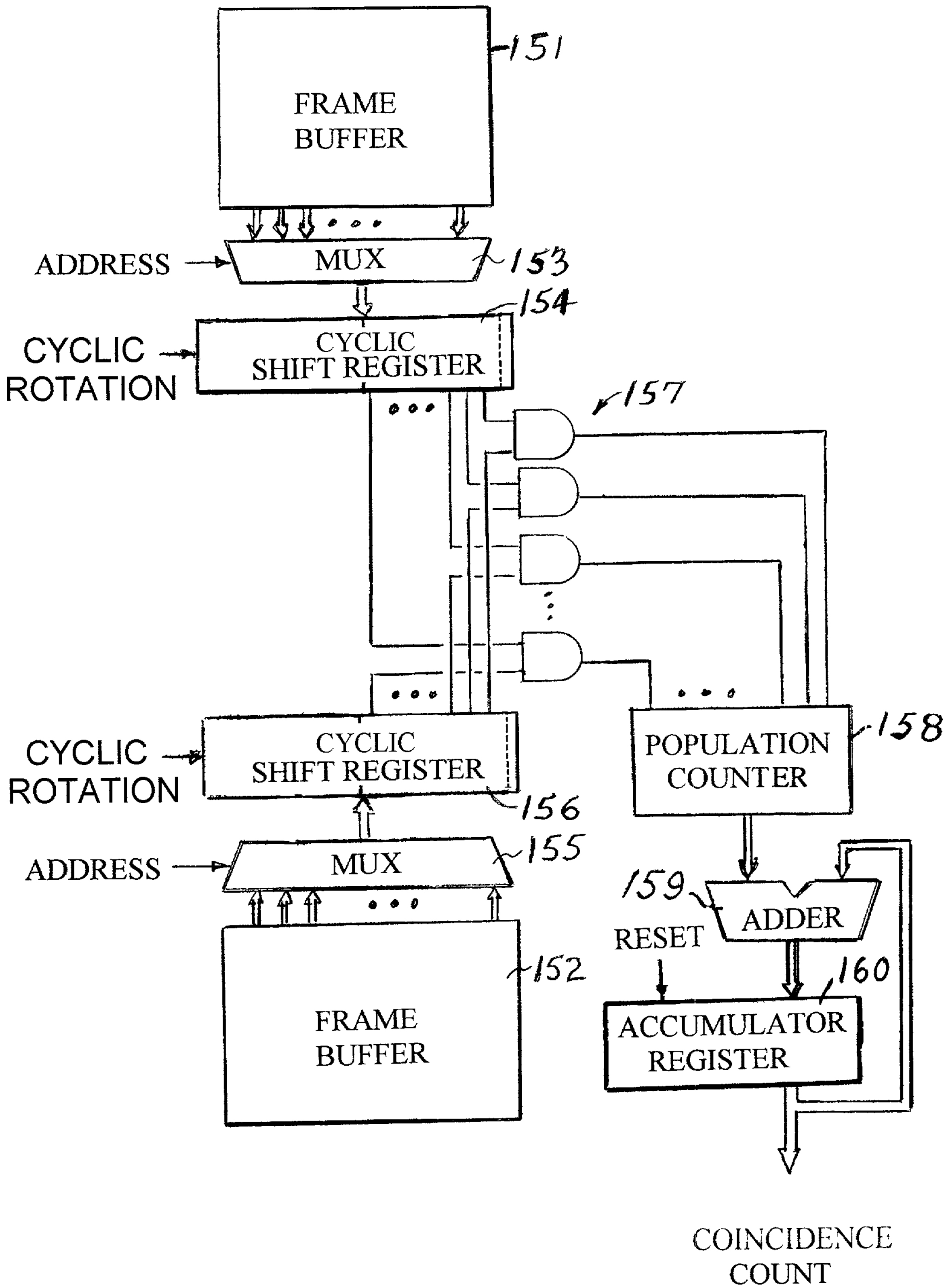
151
FRAME
BUFFER
ADDRESS
MUX
153
154
CYCLIC
ROTATION
CYCLIC
SHIFT REGISTER
157
CYCLIC
ROTATION
CYCLIC
SHIFT REGISTER
156
POPULATION
COUNTER
158
ADDRESS
MUX
155
159
ADDER
RESET
160
152
FRAME
BUFFER
ACCUMULATOR
REGISTER
COINCIDENCE
COUNT

FIG. 12

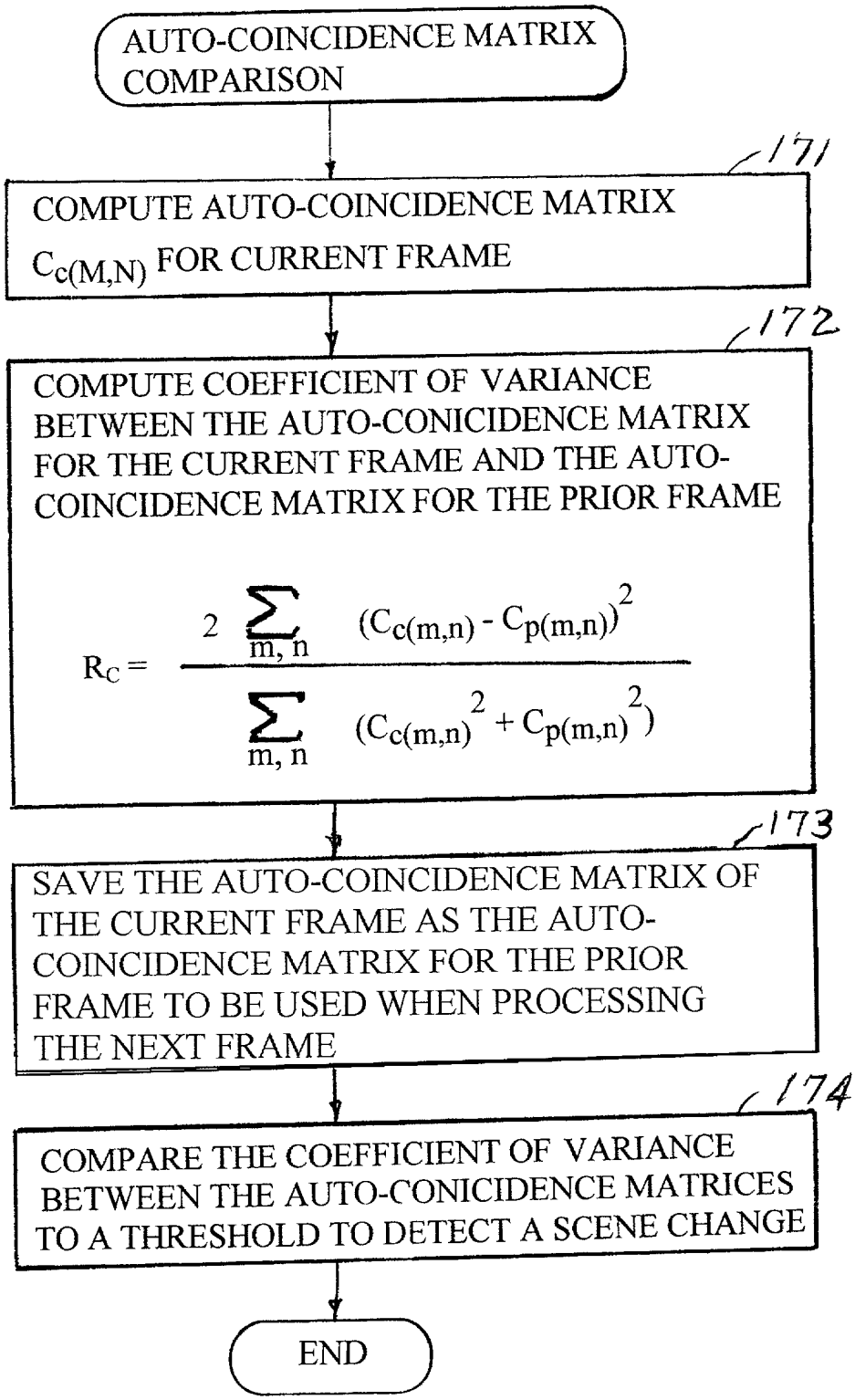

FIG. 13

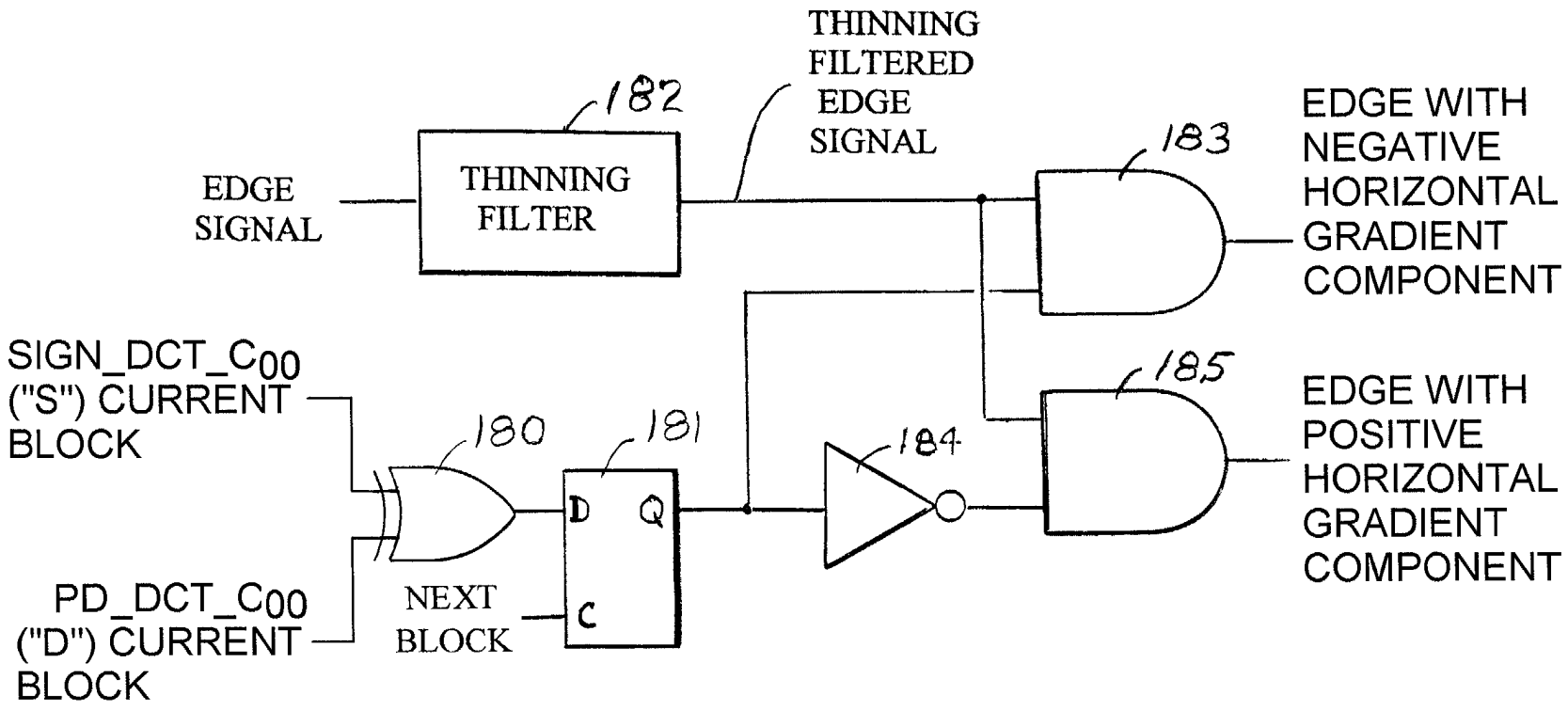
182
THINNING FILTERED EDGE SIGNAL
EDGE SIGNAL
THINNING FILTER
183
EDGE WITH NEGATIVE HORIZONTAL GRADIENT COMPONENT
SIGN_DCT_C00 ("S") CURRENT BLOCK
180
181
184
185
EDGE WITH POSITIVE HORIZONTAL GRADIENT COMPONENT
D
Q
PD_DCT_C00 ("D") CURRENT BLOCK
NEXT BLOCK
C

FIG. 14

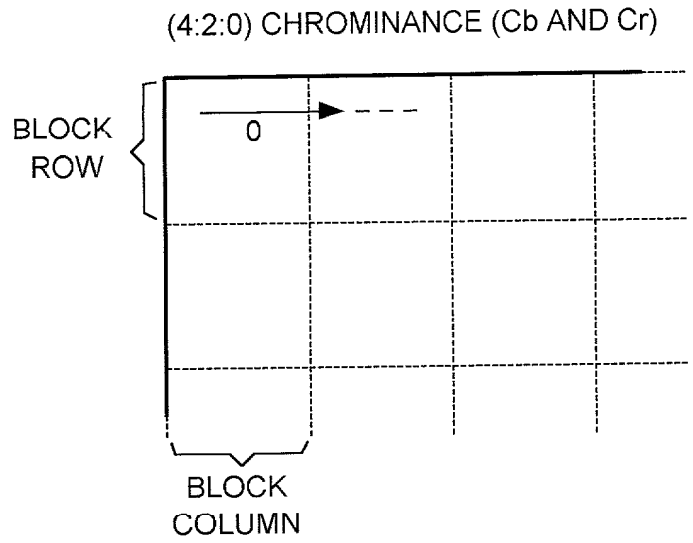

FIG. 15

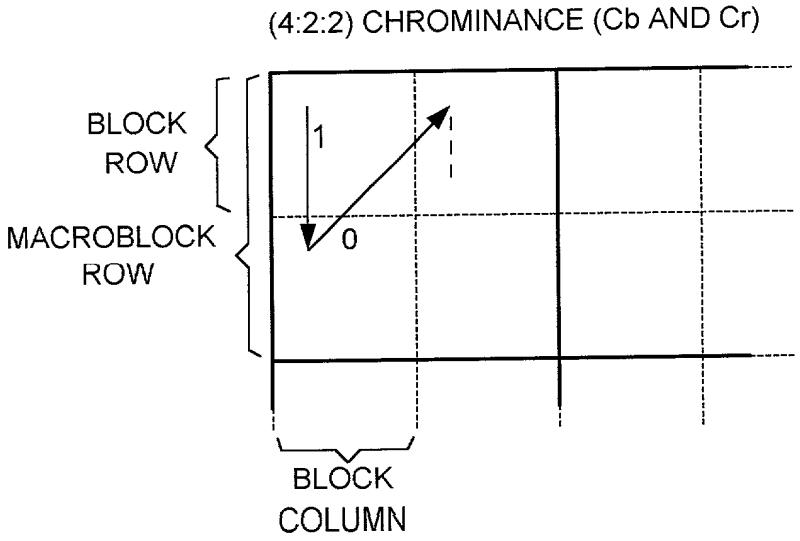

FIG. 16

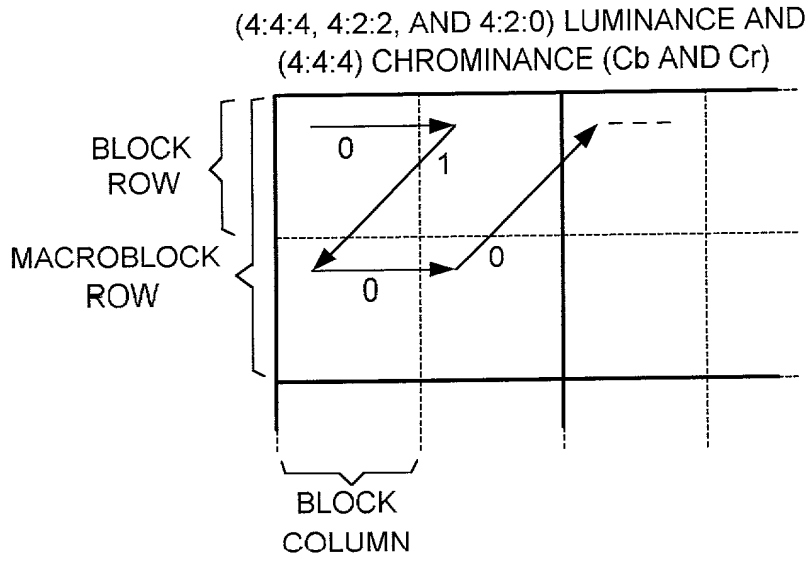

FIG. 17

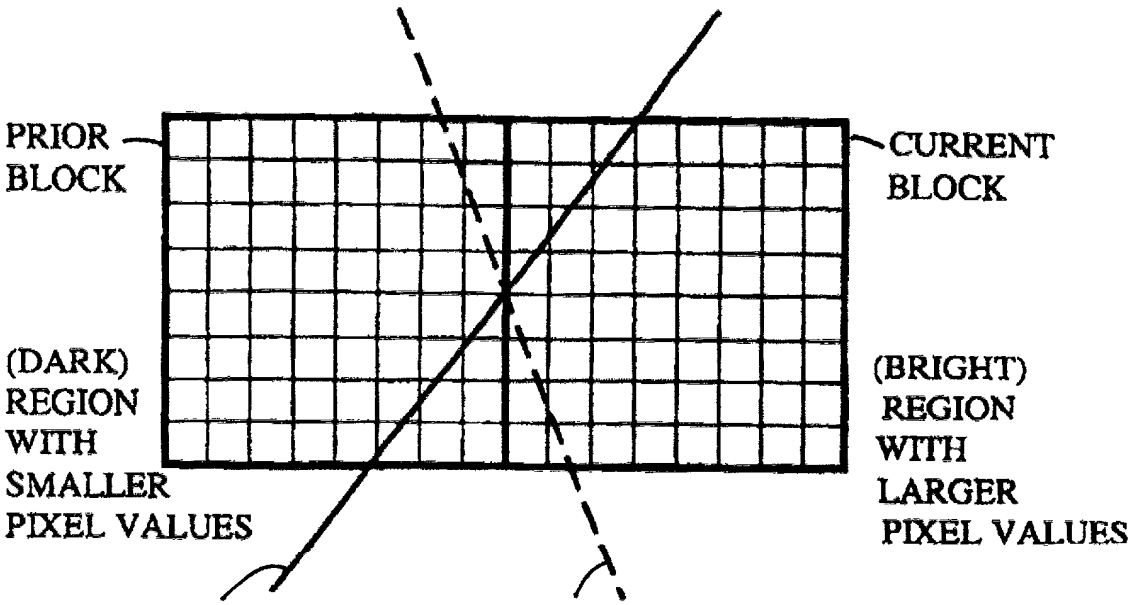

FIG. 18

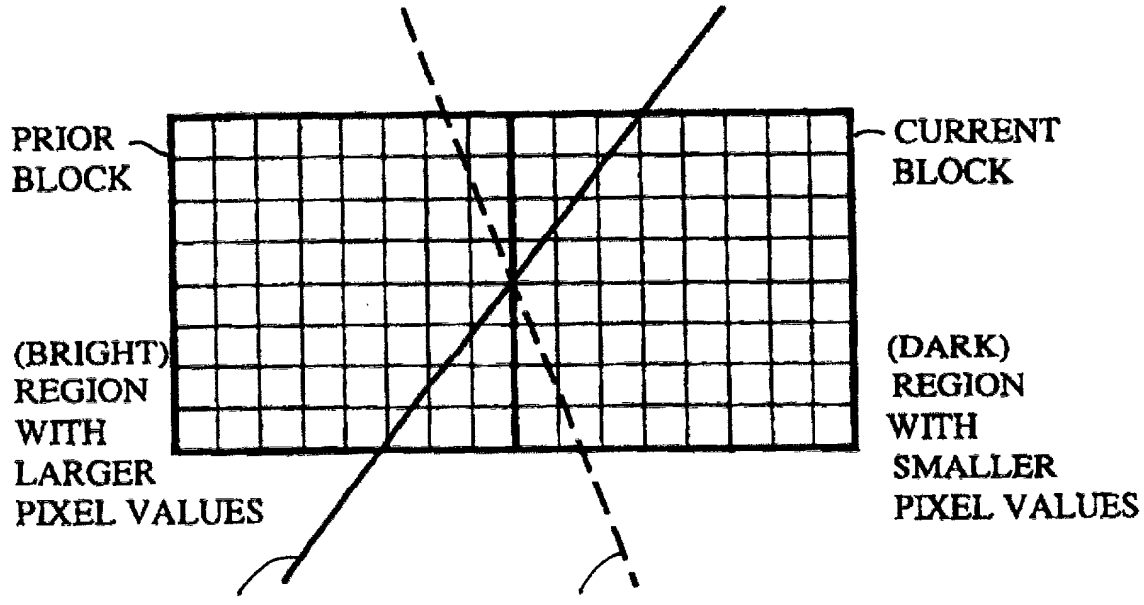

FIG. 19

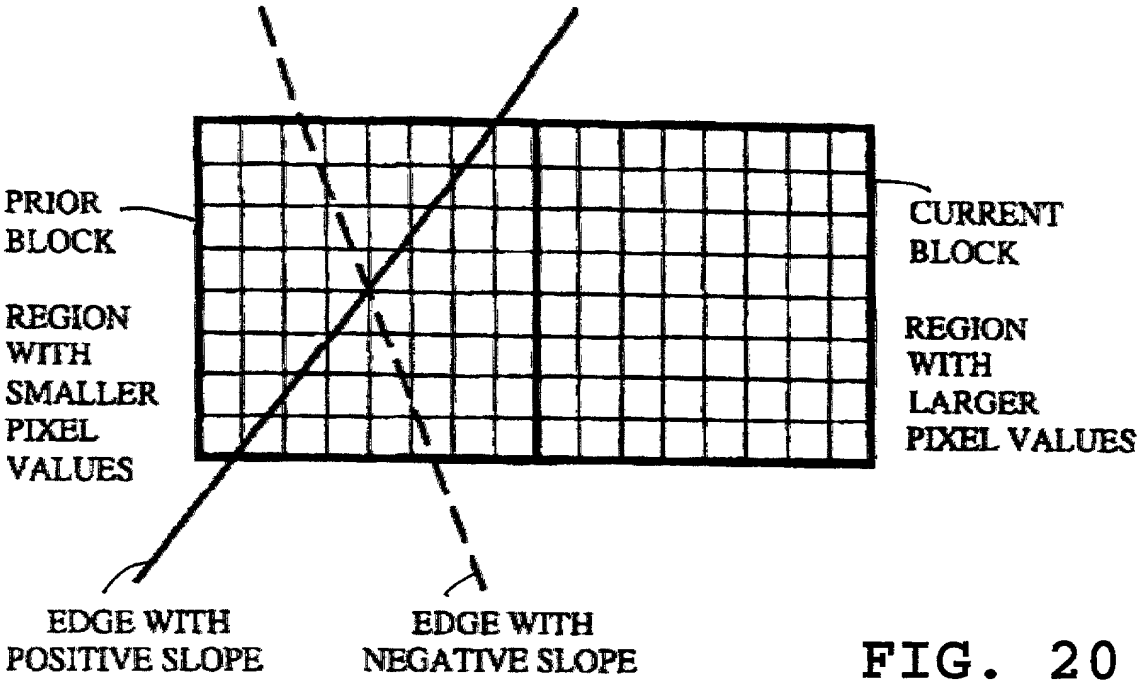

FIG. 20

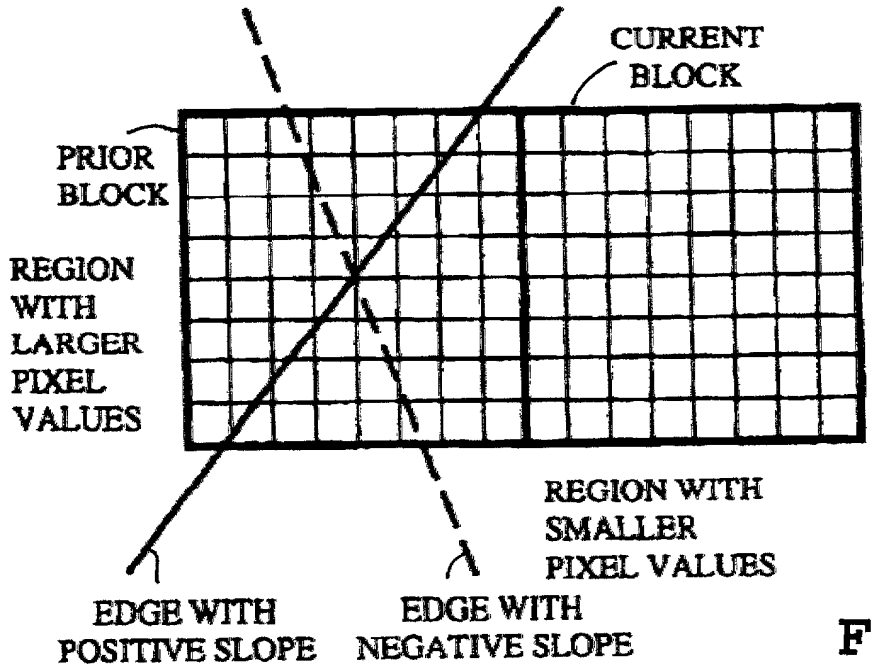

FIG. 21

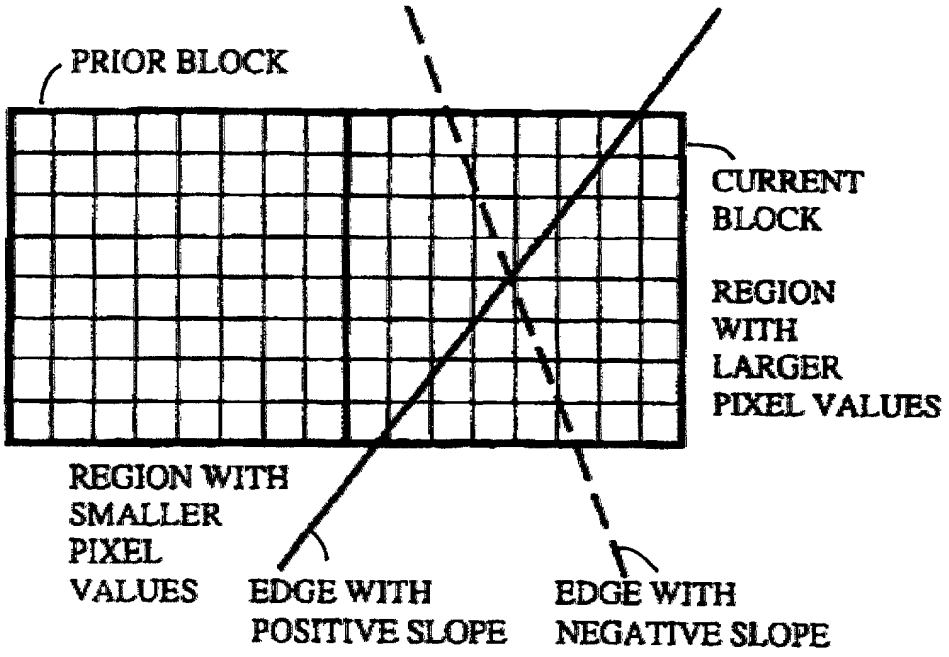

FIG. 22

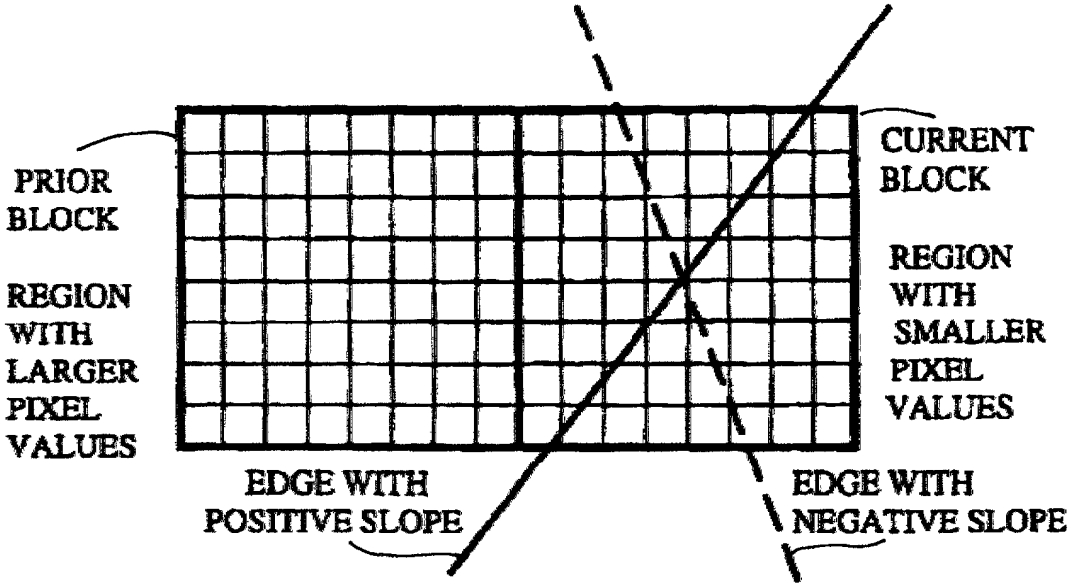

FIG. 23

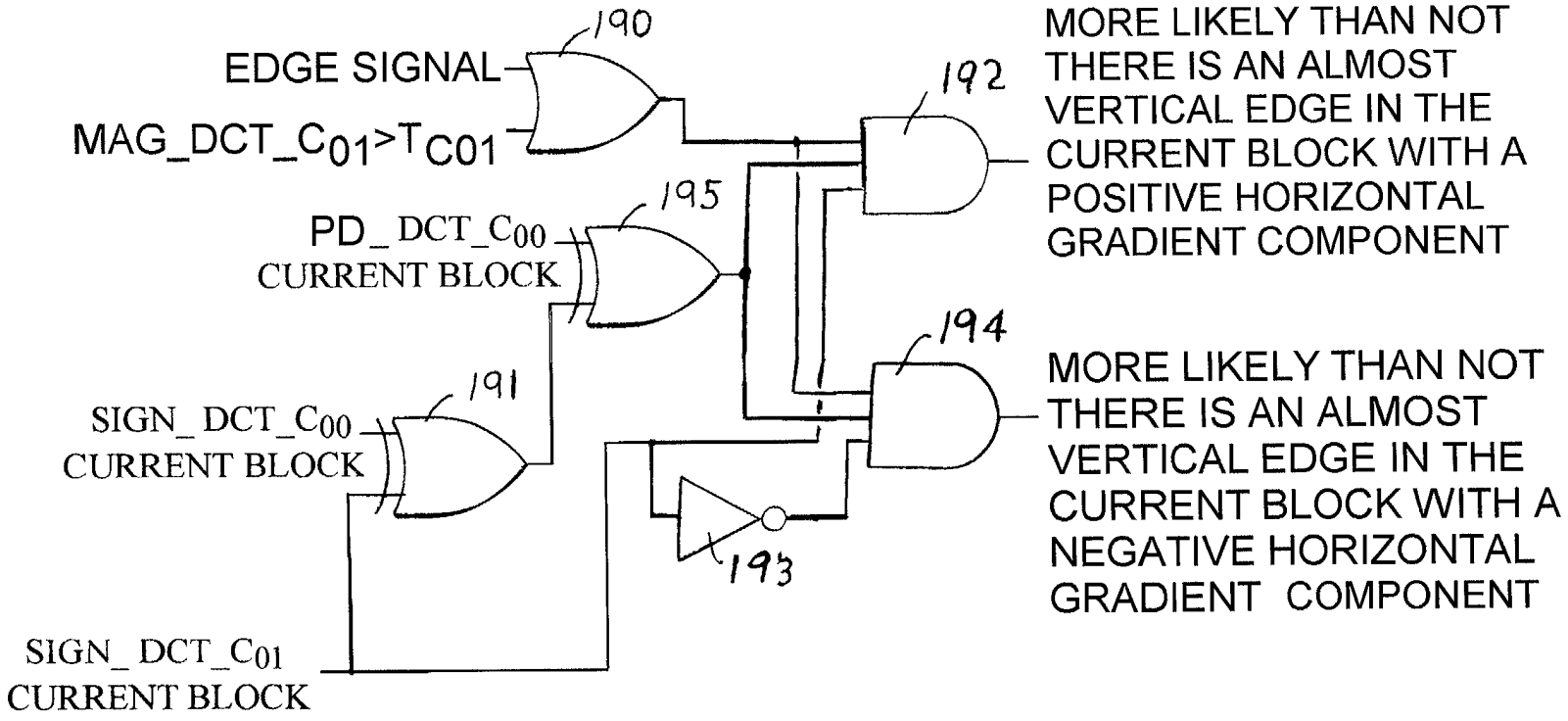
190
EDGE SIGNAL
MAG_DCT_C01>TC01
192
MORE LIKELY THAN NOT THERE IS AN ALMOST VERTICAL EDGE IN THE CURRENT BLOCK WITH A POSITIVE HORIZONTAL GRADIENT COMPONENT
195
PD_DCT_C00
CURRENT BLOCK
194
191
SIGN_DCT_C00
CURRENT BLOCK
MORE LIKELY THAN NOT THERE IS AN ALMOST VERTICAL EDGE IN THE CURRENT BLOCK WITH A NEGATIVE HORIZONTAL GRADIENT COMPONENT
193
SIGN_DCT_C01
CURRENT BLOCK

FIG. 24

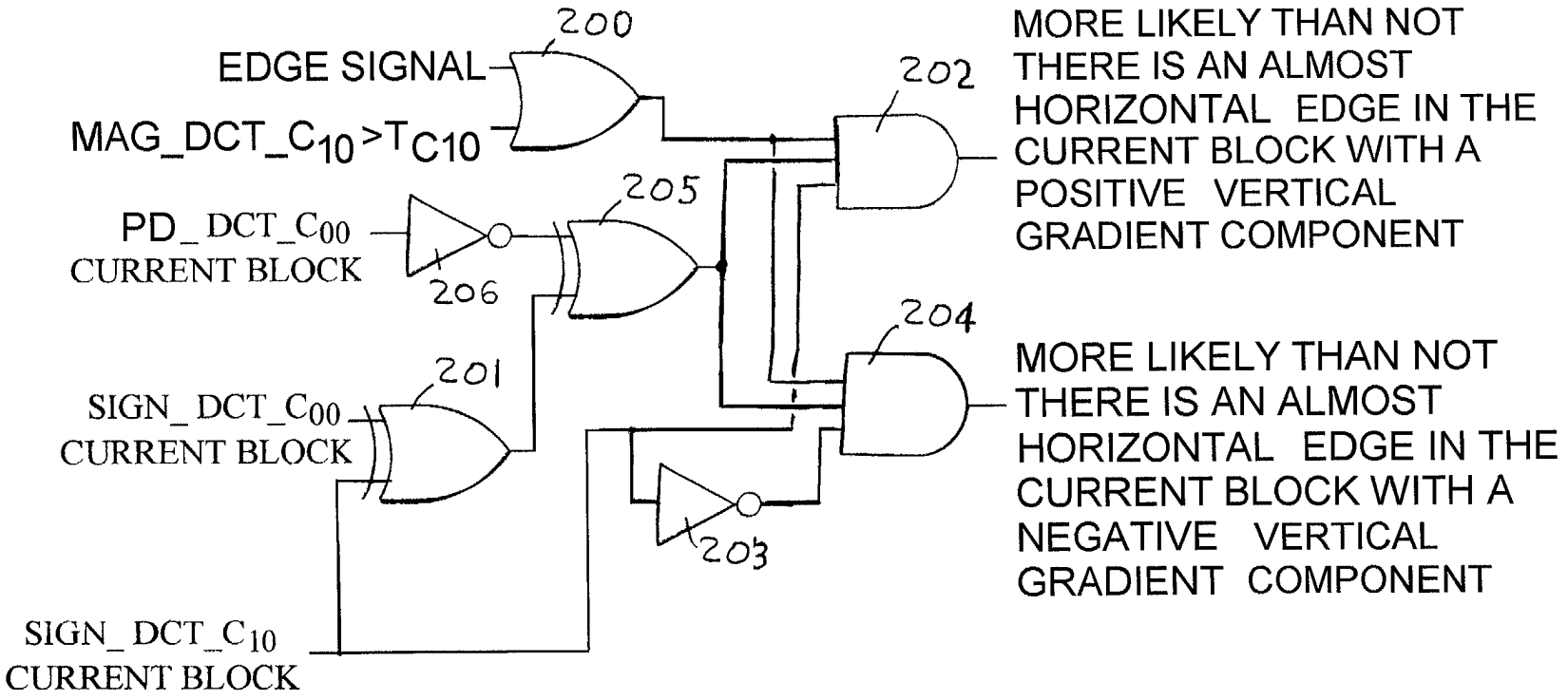
200
EDGE SIGNAL
MAG_DCT_C10 >TC10
202
MORE LIKELY THAN NOT THERE IS AN ALMOST HORIZONTAL EDGE IN THE CURRENT BLOCK WITH A POSITIVE VERTICAL GRADIENT COMPONENT
205
PD_DCT_C00 CURRENT BLOCK
206
204
201
SIGN_DCT_C00 CURRENT BLOCK
MORE LIKELY THAN NOT THERE IS AN ALMOST HORIZONTAL EDGE IN THE CURRENT BLOCK WITH A NEGATIVE VERTICAL GRADIENT COMPONENT
203
SIGN_DCT_C10 CURRENT BLOCK

FIG. 25

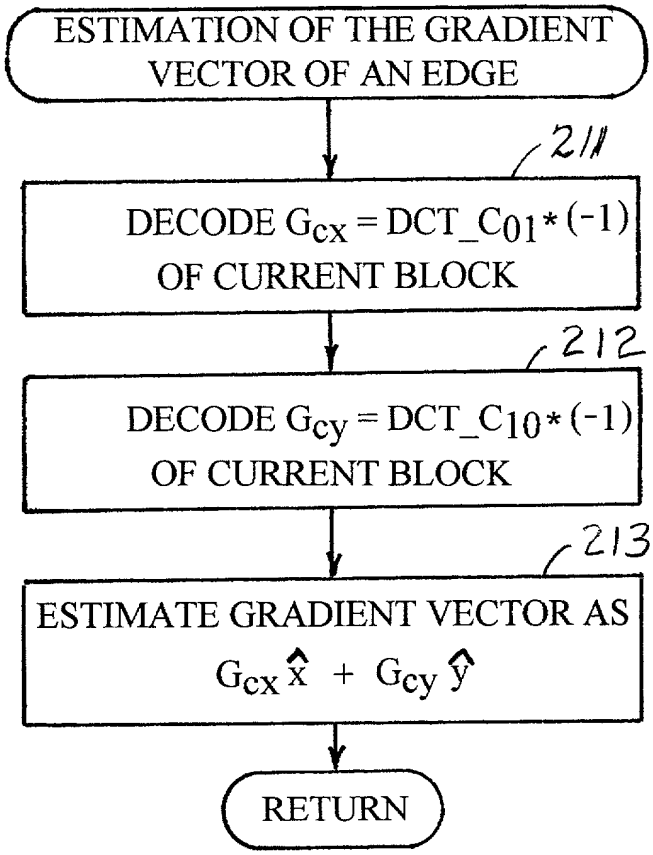

FIG. 26